

**B.Tech (Electronics and Computer Engineering) – 2022 Batch**  
**COURSE COMPONENTS & CURRICULUM**  
**Total Credit for all B.Tech. Programs: 165**

<b>PROGRAM STRUCTURE</b>			
<b>S.No</b>	<b>Category</b>		<b>Credits</b>
1	Basic Science Courses	BSC	11
2	Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc	ESC	25
3	Humanities and Social Sciences including Management courses	HSMC	15
4	Professional core courses	PCC	66
5	Professional Elective courses relevant to chosen specialization/branch	PEC	24
6	Open subjects – Electives from other technical and /or emerging subjects	OES	6
7	Project work, seminar and internship in industry or elsewhere	P	15
8	Mandatory Courses [Environmental Studies, Induction Program, Indian Constitution, Value Education etc]	MC	0
9	Online Courses*		5
	*Students shall earn 5 credits through online courses between 2 <sup>nd</sup> and 7 <sup>th</sup> semester both inclusive		
<b>Total Credits</b>			<b>167</b>

**COURSE COMPONENTS**

<b>Category 1: Basic Science Courses (BSC)</b>						
<b>Sl. No</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Hours per week</b>			<b>Credits</b>
			<b>L</b>	<b>T</b>	<b>P</b>	
1	20MA1005	Mathematical Foundation of Computing	3	1	0	4
2	20MA1006	Calculus, Vector Spaces and Laplace Transform	3	1	0	4
3	21MA2039	Probability Theory and Random Process	3	0	0	3
			<b>Total</b>			<b>11</b>
<b>Category 2: Engineering Science Courses (ESC)</b>						
<b>Sl. No</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Hours per week</b>			<b>Credits</b>
			<b>L</b>	<b>T</b>	<b>P</b>	
1	21EC1001	Electronics for Everyday Life	3	0	0	3
2	21EC1002	Computer Aided Design Laboratory	0	0	2	1
3	21EC1003	Problem Solving and Algorithmic thinking	2	0	0	2
4	20EC1003	Programming for Problem Solving with C	2	0	0	2
5	20EC1004	C Programming Laboratory	0	0	2	1
6	21EC1004	Python Programming	3	0	0	3
7	21EC1005	Python Programming Laboratory	0	0	2	1
8	21EC2001	Object Oriented programming in C++	3	0	0	3
9	21EC2002	Object Oriented programming in C++ Laboratory	0	0	2	1
10	20EC1005	Electronics For Intelligent Machines laboratory	0	0	2	1
11	19EC2001	Electronics for Intelligent Machines	2	0	0	2
12	21EC2026	Machine Learning Laboratory	0	0	2	1
13	21EC2027	LINUX Programming	3	0	0	3
14	ITP2911	Industrial Training (2 Weeks)	0	0	2	1
			<b>Total</b>			<b>25</b>
<b>Category 3: Humanities &amp; Social Sciences Including Management Courses (HSMC)</b>						
<b>Sl. No</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Hours per week</b>			<b>Credits</b>
			<b>L</b>	<b>T</b>	<b>P</b>	
		<b>Humanities, Social Sciences and Management Courses</b>				<b>5</b>

1	20MS2005	Soft Skills	1	0	0	1
2	19EN1001/ 19LN1001/ 17LN2007	English / German / Basic French	2	0	0	2
3	18MS2001	Professional Ethics	2	0	0	2
<b>Entrepreneurship</b>						<b>10</b>
1	20MS2003	Concepts of Entrepreneurship	1	0	0	1
2	20MS2004	Entrepreneurship and Product Development	3	0	0	3
3	18MS2002	Industrial Management	3	0	0	3
4	20MS2008	Artificial Intelligence for Business	3	0	0	3
			<b>Total</b>			<b>15</b>

**Category 4: Professional Core**

Sl. No	Course Code	Course Title	Hours Per Week			Credits
			L	T	P	
1	21EC1006	Introduction to Computer Engineering	3	0	0	3
2	21EC1007	Software Engineering	1	0	0	1
3	21EC2003	Electronic Devices and Circuits	3	0	0	3
4	21EC2004	Electronic Devices and Circuits Laboratory	0	0	2	1
5	18EC2003	Digital System Design	3	0	0	3
6	18EC2004	Digital System Design Laboratory	0	0	2	1
7	21EC2005	Operating Systems	3	0	0	3
8	21EC2006	Mathematics for Signal Analysis	2	1	0	3
9	21EC2007	Data Structures and Algorithms	3	0	0	3
10	21EC2008	Data Structures Laboratory	0	0	2	1
11	21EC2009	Fundamentals of JAVA Programming	2	1	0	3
12	21EC2010	Linear Integrated Circuits	3	0	0	3
13	21EC2011	Analog Electronics	3	0	0	3
14	22EC2018	Signal Processing and its Applications	2	1	0	3
15	22EC2019	Signal Processing Laboratory	0	0	2	1
16	21EC2014	Microprocessors and Microcontrollers	3	0	0	3
17	21EC2015	Web Technology	3	0	0	3
18	21EC2016	Internet of Things	3	0	0	3
19	21EC2017	Internet of Things Laboratory	0	0	2	1
20	21EC2018	Machine Learning	3	0	0	3
21	21EC2019	System Software and Compiler Design	2	0	0	2
22	21EC2020	Data Communication Networks	3	0	0	3
23	21EC2021	Multimedia Engineering	3	0	0	3
24	21EC2022	Multimedia Engineering Laboratory	0	0	2	1
25	21EC2023	Cyber Security	3	0	0	3
26	21EC2024	Cloud and Distributed Computing	3	0	0	3
27	21EC2025	Neural Networks and Deep Learning	3	0	0	3
<b>Total</b>						<b>66</b>

**Category 6: Professional Electives**

Sl. No	Course Code	Course Title	Hours Per Week			Credits
			L	T	P	
1	21EC2028	Data Analytics & Visualization	3	0	0	3
2	21EC2029	High Performance Computing	3	0	0	3
3	21EC2030	Theory of Computation and Compiler Design	3	0	0	3
4	21EC2031	Semantic Modelling and its Applications	3	0	0	3
5	21EC2032	Computer Vision	3	0	0	3
6	21EC2033	Embedded System Design	3	0	0	3
7	21EC2034	Cyber Physical Systems	3	0	0	3
8	21EC2035	Data Mining	3	0	0	3

9	21EC2036	Metaheuristic Algorithms	3	0	0	3
10	21EC2037	Human Computer Interface	3	0	0	3
11	21EC2038	Signal Processing Algorithms and its Architectures	3	0	0	3
12	21EC2039	Beyond CMOS Device Technologies	3	0	0	3
13	21EC2040	MEMS and Semiconductor Sensors	2	0	0	2

#### Professional Electives for Specialization in Data Science

Course Code	Course Title	L	T	P	Credits
22EC2001	Introduction to Big Data	3	0	0	3
22EC2002	Social Media Analytics	3	0	0	3
22EC2003	Video Processing and Analytics	3	0	0	3
22EC2004	Data Visualization Techniques	3	0	0	3

#### Professional Electives for Specialization in Artificial Intelligence

Course Code	Course Title	L	T	P	Credits
22EC2005	Pattern Recognition Techniques	3	0	0	3
22EC2006	Deep Learning	3	0	0	3
22EC2007	Natural Language Processing	3	0	0	3
22EC2008	Introduction to Human Computer Interaction	3	0	0	3
22EC2009	Bio-inspired Optimization Techniques	3	0	0	3
22EC2027	Brain Computer Interface	3	0	0	3

### SEMESTER-WISE CURRICULUM

#### SEMESTER 1

Course Code	Course Title	L	T	P	Credits
21EC1006	Introduction to computer Engineering (related with computer architecture)	3	0	0	3
21EC1001	Electronics for everyday life - Project based course	3	0	0	3
21EC1002	Computer Aided Design Lab	0	0	2	1
20MA1005	Mathematical Foundations of Computing	3	0	0	3
19EN1001/ 19LN1001/ 17LN2007	English / German / Basic French	2	0	0	2
20EC1003	Programming for Problem Solving with C	2	0	0	2
20EC1004	C Programming Laboratory	0	0	2	1
	Mandatory course – I	3	0	0	0
	<b>Total Credits</b>				<b>15</b>

#### SEMESTER 2

Course Code	Course Title	L	T	P	Credits
20MA1006	Calculus, Vector Spaces and Laplace Transform	3	0	0	3
21EC1003	Problem solving and algorithmic thinking	2	0	0	2
21EC1004	Python Programming (Project-based course)	3	0	0	3
21EC1005	Python Programming Laboratory	0	0	2	1
19EC2001	Electronics for Intelligent Machines (Design thinking course)	2	0	0	2
20EC1005	Electronics for Intelligent Machines Laboratory	0	0	2	1
21EC1007	Software Engineering	1	0	0	1
20MS2005	Soft Skills	1	0	0	1
	Mandatory Course-II	3	0	0	0
	<b>Total Credits</b>				<b>14</b>

#### SEMESTER 3

Course Code	Course Title	L	T	P	Credits
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21EC2001	Object Oriented programming in C++ (Project-based course)	3	0	0	3
21EC2002	Object Oriented programming in C++ Laboratory	0	0	2	1
21EC2003	Electronic Devices and Circuits	3	0	0	3
21EC2004	Electronic Devices and Circuits Laboratory	0	0	2	1
18EC2003	Digital System Design (Project based course)	2	1	0	3
18EC2004	Digital System Design Laboratory	0	0	2	1
21EC2005	Operating Systems	3	0	0	3
21EC2006	Mathematics for Signal Analysis	2	1	0	3
	Open Elective - 1	3	0	0	3
ITP2911/ MP2921	Industrial Training/ Mini Project I	0	0	2	1
	<b>Total Credits</b>				<b>22</b>
	Mandatory course	No credit			

#### SEMESTER 4

Course Code	Course Title	L	T	P	Credits
21EC2007	Data structures and Algorithms	3	0	0	3
21EC2008	Data Structures Laboratory	0	0	2	1
21EC2009	Fundamentals of JAVA Programming	2	1	0	3
21EC2010	Linear Integrated Circuits	3	0	0	3
21EC2011	Analog Electronics	3	0	0	3
21EC2027	LINUX programming	3	0	0	3
21EC2015	Web Technology	3	0	0	3
	Professional Elective - 1	3	0	0	3
18MS2002	Industrial Management	3	0	0	3
ISP2921	Internship I	0	0	2	1
	<b>Total Credits</b>				<b>26</b>
	Mandatory course	No credit			

#### SEMESTER 5

Course Code	Course Title	L	T	P	Credits
22EC2018	Signal Processing and its Applications	2	1	0	3
22EC2019	Signal Processing Laboratory	0	0	2	1
21MA2039	Probability Theory and Random Process	3	0	0	3
21EC2014	Microprocessors and Microcontrollers	3	0	0	3
21EC2016	Internet of Things	3	0	0	3
21EC2017	Internet of Things Laboratory	0	0	2	1
ISP2922	Internship II	0	0	2	1
20MS2003	Concepts of Entrepreneurship	1	0	0	1
	Professional Elective – 2	3	0	0	3
	Open Elective – 2	3	0	0	3
	<b>Total Credits</b>				<b>22</b>
	Mandatory course	No credit			

#### SEMESTER 6

Course Code	Course Title	L	T	P	Credits
21EC2018	Machine Learning	3	0	0	3
21EC2019	System Software and Compiler Design	2	0	0	2
ISP2923	Internship III	0	0	2	1
	Professional Elective – 3	3	0	0	3
	Professional Elective – 4	3	0	0	3
	Professional Elective – 5	3	0	0	3
18MS2001	Professional Ethics	2	0	0	2
21EC2020	Data Communication Networks	3	0	0	3

21EC2025	Neural Networks and Deep Learning	3	0	0	3
21EC2026	Machine Learning Laboratory	0	0	2	1
	<b>Total Credits</b>				<b>24</b>
	Mandatory course	No credit			

#### SEMESTER 7

Course Code	Course Title	L	T	P	Credits
	Professional Elective -6 (project based course)	3	0	0	3
	Professional Elective -7	3	0	0	3
21EC2023	Cyber Security	3	0	0	3
20MS2004	Entrepreneurship and Product Development	3	0	0	3
21EC2024	Cloud and Distributed Computing	3	0	0	3
21EC2021	Multimedia Engineering	3	0	0	3
21EC2022	Multimedia Engineering Laboratory	0	0	2	1
20MS2008	Artificial Intelligence for Business	3	0	0	3
	<b>Total Credits</b>				<b>22</b>

#### SEMESTER 8

Course Code	Course Title	L	T	P	Credits
	Professional Elective -8	3	0	0	3
22EC2999	Project/patent/products	0	0	24	12
	<b>Total Credits</b>				<b>15</b>